

## UNCLASSIFIED

<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>								DATE <b>June 2001</b>																																																														
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>																																																																		
COST <i>(In Thousands)</i>	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost																																																												
Total Program Element (PE) Cost	83984	129699																																																																				
1161 Advanced Sensor Technology*	3999	35423																																																																				
2259 Israeli Cooperative Project	79985	94276																																																																				
<p>The BMD Program and resulting FY02 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY02, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Elements 0603881C and 0603884C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.</p> <p><b>A. Mission Description and Budget Item Justification</b></p> <p>This program is in Budget Activity 4 – Demonstration and Validation, Research Category 6.3B. The International Cooperative Program Element (PE) was created at Congressional direction. This PE provides for cooperative efforts with Israel and the Russian Federation. Cooperation with Israel centers around the development of an initial capability for the Arrow Missile Defense system that is interoperable with U.S. missile defense forces. The PE also provides for work with the Russian Federation to demonstrate advanced space-based remote sensor technologies and supports other cooperative research.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;"><b>B. Program Change Summary</b></th> <th style="text-align: center;"><u>FY 2000</u></th> <th style="text-align: center;"><u>FY 2001</u></th> <th style="text-align: center;"><u>FY 2002</u></th> <th style="text-align: center;"><u>FY 2003</u></th> </tr> </thead> <tbody> <tr> <td>Previous President's Budget (<u>FY 2001 PB</u>)</td> <td style="text-align: right;">81560</td> <td style="text-align: right;">116992</td> <td></td> <td></td> </tr> <tr> <td>Congressional Adjustments</td> <td></td> <td style="text-align: right;">14000</td> <td></td> <td></td> </tr> <tr> <td>Appropriated Value</td> <td></td> <td style="text-align: right;">130992</td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>a. Congressional General Reductions</td> <td></td> <td style="text-align: right;">-1008</td> <td></td> <td></td> </tr> <tr> <td>b. SBIR / STTR</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>c. Omnibus or Other Above Threshold Reductions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>d. Below Threshold Reprogramming</td> <td style="text-align: right;">2334</td> <td></td> <td></td> <td></td> </tr> <tr> <td>e. Rescissions</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Adjustments to Budget Years Since <u>FY 2001 PB</u></td> <td style="text-align: right;">2334</td> <td style="text-align: right;">12992</td> <td></td> <td></td> </tr> <tr> <td>Current Budget Submit (<u>FY 2002 PB</u>)</td> <td style="text-align: right;">83894</td> <td style="text-align: right;">129699</td> <td></td> <td></td> </tr> </tbody> </table>											<b>B. Program Change Summary</b>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	Previous President's Budget ( <u>FY 2001 PB</u> )	81560	116992			Congressional Adjustments		14000			Appropriated Value		130992			Adjustments to Appropriated Value					a. Congressional General Reductions		-1008			b. SBIR / STTR					c. Omnibus or Other Above Threshold Reductions					d. Below Threshold Reprogramming	2334				e. Rescissions					Adjustments to Budget Years Since <u>FY 2001 PB</u>	2334	12992			Current Budget Submit ( <u>FY 2002 PB</u> )	83894	129699		
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)</b>		DATE <b>June 2001</b>
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>	PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>	
<p>Change Summary Explanation: Significant FY01 increase due to Congressional Action.</p> <p>The BMD Program and resulting FY02 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY02, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Elements 0603880C, 0603881C, and 0603884C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.</p>		
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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>								DATE <b>June 2001</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>				PROJECT <b>1161</b>		
COST <i>(In Thousands)</i>	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
1161 Advanced Sensor Technology*	3999	35423								

\*FY00 activities partially funded from reprogrammed FY99 resources.

**A. Mission Description and Budget Item Justification**

To prepare for critical future active defense needs, BMDO will conduct a balanced international cooperative program of high leverage technologies that yield improved capabilities across a selected range of advanced sensors. The objectives of these cooperative investments are subsystems with improved performance and reduced costs for acquisition programs.

Russian-American Cooperative Programs:

- The Russian-American Observation Satellites (RAMOS) program is an innovative U.S.-Russian space-based remote sensor research and development program addressing ballistic missile defense and national security. This program engages Russian developers of early warning satellites in the joint definition and execution of aircraft and space experiments. The program will ultimately design, build, launch, and operate two satellites that will provide stereoscopic observations of the earth's atmosphere and ballistic missile launches in the short wavelength and mid-to-long wavelength infrared bands. Near-term experiments have focused on planning and executing nearly simultaneous observations of Earth features using U.S. and Russian satellites. The final phase of the near-term experiments included the development of U.S. and Russian instruments for proof-of-concept measurements from the Flying Infrared Signatures Technology Aircraft (FISTA).

**FY 2000 Accomplishments:**

- (\$4.260M provided from FY99 funds reprogrammed in accordance with the FY00 Program Budget Decision 224C). Continued to collect and analyze data from specialized infrared sensors developed by the United States and Russia and flown aboard the U.S. Flying Infrared Signature Technology Aircraft (FISTA). Continued efforts focused on the modeling and simulation of high-altitude cloud sun glint and cloud background scene structure in the mid-to-longwave infrared band. Finalized prototype design of a space hyperspectral polarimeter. Conducted a scientific review of the program objectives and validated that the utility of RAMOS results still justify the technology investment.

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•	3999	Began the preliminary design process for the satellite experiment to confirm application of chosen bandwidths toward meeting program objectives. Reviewed system and subsystem requirements, identified risk items and provided recommended mitigation. Initiated discussions on government-to-government agreement, which defines work package split between the United States and Russia concerning launch vehicles, integration planning, mission operations concept, and data analysis capabilities. Began preliminary design process for the platform and instruments including definition of system level requirements, identification of interfaces, and analysis of alternatives. Outlined concept of operations and began experiment planning.									
Total		3999									
<b>FY 2001 Planned Program:</b>											
•	26223	Translate program objectives into system requirements and specifications from which the preliminary design of the Russian built satellites and supporting systems are derived. Complete the preliminary design process for the space platform, ground system, and launch vehicle including component specifications, draft test plans, trade-off analysis and risk mitigation plans. Design and fabricate mock-ups of the satellite platform to be used to support integration development and design. Complete the preliminary design process for the primary sensor package including component specifications, test plans, trade-off analysis and risk mitigation plans. Design and fabricate mock-ups of the sensor package to be used to support integration development and design. Continue to update concept of operations and experiment plans based on system design. Begin data management plan.									
•	8900	Establish system engineering and configuration control processes. Define work package split between the United States and Russia concerning launch vehicles, integration planning, mission operations concept, configuration control, and data analysis capabilities. Monitor and facilitate progress of preliminary design. Provide technical review of exported data. Prepare program documentation for technology protection and security. Provide in country administrative, security and technical support of RAMOS Program Office.									
•	300	Validate models used for predictions of background scene clutter. Provide reliable estimates of the effects of sensor performance on the background clutter suppression performance of chosen algorithms. Assess sensor jitter models to provide a more robust assessment of the relative performance of the RAMOS bands for tracking of post-burnout theatre targets.									
Total		35423									
<b>B. Other Program Funding Summary</b>		<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
N/A											
<p><b>C. Acquisition Strategy:</b>  RAMOS is a cooperative experiment program designed to engage the Russians in early warning and theater missile defense related technologies. The tasks to complete the design, fabrication, launch, and operations of the two-satellite constellation will be completed under three major contracts.</p> <p>The first contract is with Utah State University (USU)/Space Dynamics Laboratory (SDL), a designated University Affiliated Research Center for space sensors. SDL is the current U.S. prime contractor for RAMOS and has a prime/subcontractor relationship with the Russian State Company, Rosvoorouzhenie (now Rosoboronexport), for</p>											
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<p>Russian tasks. This contractual approach will be used for design and development of the RAMOS system through the Preliminary Design Review (PDR) scheduled for 2Q FY02. After PDR, USU will remain as the prime U.S. contractor for the sensor development and fabrication as well as mission planning and data reduction.</p> <p>The second contract will be a direct contract with the Russian State Company, Rosoboronexport (formerly Rosvoorouzhenie.) During FY01, BMDO plans to negotiate a government-to-government agreement with the Russian Federation to govern the RAMOS program. Once this agreement is concluded, BMDO will contract directly with Rosoboronexport for the Russian efforts. Under this contract, Rosoboronexport, through Russian subcontractors, will be responsible for the development and fabrication of the satellite platforms, development and operation of the ground system, and launch services for the two RAMOS satellites.</p> <p>The third contract is with Ball Aerospace and Technologies Corporation of Boulder, CO. As the Systems Engineering and Integration contractor for BMDO, BATC will be primarily responsible for monitoring the Russian effort and facilitating the integration of U.S. and Russian components. Ball will also support preparation of program documentation for technology protection and security and provide in country administrative, security and technical support of RAMOS Program Office.</p>																																																																																																																																																											
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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>				PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>				PROJECT <b>1161</b>
Sensor GFE delivered to Russia								
Begin Sensor to Satellite Integration								
Begin Ground Segment Integration								
Satellite Fabrication and Testing Complete								
Launch								
On Orbit Operations Begin								
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<b>BMDO RDT&amp;E COST ANALYSIS (R-3)</b>										DATE <b>June 2001</b>		
BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>					PROJECT <b>1161</b>		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Hardware Development	CPAF	USU/SDL, Logan, UT	41525	26223								
b. Hardware Development	OTAF	Rosoboronexport, RF										
c. Hardware Development	CPAF	BATC, Boulder CO		8000	25 Jan 01							
Subtotal Product Development:			41525	34223								
Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD. Funding for Rosoboronexport in FY2001 and prior is as a subcontract to USU/SDI.												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Development Support	Allot	AFRL, Hanscom AFB	1925	300								
Subtotal Support Costs:			1925	300								
Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD												
AFRL technical support will be required in program development, experiment planning and data analysis, with emphasis on earth backgrounds, data certification, technology transfer and surveillance.												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.			0	0								
b.												
c.												
d.												
e.												
f.												
Subtotal Test and Evaluation:												
Remark:												
Project 1161												

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BUDGET ACTIVITY <b>4 - Demonstration and Validation</b>					PE NUMBER AND TITLE <b>0603875C International Cooperative Programs</b>					PROJECT <b>1161</b>		
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Program Management Support	CPFF	CSC/NRC, Arlington, VA and Aerospace, El Segundo CA	1095	900								
Subtotal Management Services:			1095	900								
Project Total Cost:												
Remark: Prior to FY 1999, the RAMOS program was in BA3 - Advanced Technology Development, PE 0603173C, Support Technologies – ATD												

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<i>COST (In Thousands)</i>	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
2259 Israeli Cooperative Project	79985	94276								

**A. Mission Description and Budget Item Justification**

This project provides funding for the Arrow Deployability Program (ADP) to include the third Arrow battery and Arrow interoperability with U.S. Theater Missile Defense (TMD) systems, as well as the Arrow System Improvement Program (ASIP), Israeli Test Bed (ITB), and the Israeli System Architecture and Integration (ISA&I). The United States derives considerable benefits from its participation in these projects. The presence of a ballistic missile defense system in Israel developed under this project helps ensure U.S. freedom of action in future contingencies and provides protection against ballistic missile attacks to U.S. forces deployed to the region. The cooperative effort also provides risk reduction and alternative technologies for U.S. ballistic missile defense programs as well as phenomenology and kill assessment data.

The ADP consists of efforts to integrate and test the elements making up a ballistic missile defense system for Israel. Under the ADP, the jointly developed Arrow II interceptor and launcher are being integrated with the Israeli developed Arrow components, to include: fire control radar (Green Pine), battle management center (Citron Tree) and launcher control center (Hazelnut Tree). The ADP is the third phase of the cooperative Arrow program. Phase I consisted of the Arrow Experiments project that cooperatively developed the pre-prototype Arrow I interceptor. It was followed by the Arrow Continuation Experiments (ACES) project which consisted of critical lethality and flight tests using the upgraded Arrow II interceptor. The Arrow II interceptor development, now complete, provided the basis for an informed Government of Israel (GOI) engineering and manufacturing decision to proceed with development of an integrated ballistic missile defense capability. ACES was highly successful and satisfied the Israeli requirement for a ballistic missile interceptor for defense of Israeli critical assets and population centers. The phase II program contributed to the U.S. technology base for new advanced ballistic missile defense technologies that were incorporated into the U.S. TMD systems, and also provided risk reduction technologies in the event that U.S. TMD technical efforts failed to meet expectations.

The third phase is the current ADP, which began in FY96. This phase of the program provides for development, test, and deployment of an Arrow User Operational Evaluation System (UOES) to permit the Government of Israel to make a decision regarding its deployment (without financial participation by the United States beyond the Research and Development (R&D) stage). This effort includes integrated system-level flight tests of the total Arrow Weapon System (AWS). The first such integrated intercept flight test was successfully conducted in Israel on November 1, 1999. The Green Pine radar detected a Scud-class ballistic target, and the Citron Tree battle management center commanded the launch of the Arrow II interceptor and communicated with it in-flight to successfully destroy the incoming missile. A second ADP intercept flight test, conducted on September 14, 2000, was the first intercept of an air-launched Black Sparrow ballistic target. In this intercept test, the target was flown toward Israel making this the first Arrow intercept of an incoming target vice past intercept test wherein the target was flown away from Israel.

The International Agreement (IA) between the U.S. and Israel for the ADP will be amended to provide additional funding of \$34M in FY02 for the Arrow third battery. In January 1998, Israel requested \$169 million to fund the procurement of a third Arrow battery. Congress provided a plus-up of \$45M in FY98 and a second \$45M plus-up in FY00. DoD requested, and Congress appropriated, third battery funding of \$45M in FY01. For each third battery installment, Congress authorized the ADP

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<b>BMDO RDT&amp;E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)</b>		DATE <b>June 2001</b>
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<p>IA to be amended to increase the U.S. cost share and allow Israel to withdraw an equal to acquire components of the third battery. Of the total \$169M requested by Israel in January 1998 for the third Arrow battery, a balance of \$34 M now remains. DoD has programmed that amount in FY02 as the final installment, which will then complete the U.S. commitment.</p> <p>Arrow is being made interoperable with U.S. TMD systems using the Joint Tactical Information Distribution Systems (JTIDS)/Link-16 communications architecture and message protocol. An interface has now been developed and delivered in Israel for AWS interoperability. Early proof-of-concept tests using the BMDO-developed TMD System Exerciser (TMDSE) have been conducted via interactive simulation exercises to lay the foundation for future test, assessment, and validation of the JTIDS-based interoperability between the AWS and U.S. TMD systems. The TMDSE experiments, to be largely completed in FY01, will assess AWS operability with deployed U.S. TMD systems. The interoperability effort will be funded in FY01 by a \$6M Congressional add-on which also pays back Israeli money which funded the effort in FY00.</p> <p>An Arrow System Improvement Program (ASIP) feasibility study will be conducted in FY01 to explore ways to maintain the Arrow's capability against emerging regional threats, including countermeasures and longer range ballistic missiles. This effort will be funded in FY01 by an \$8M Congressional add-on. The United States and Israel will determine, at the conclusion of the feasibility study, whether the ASIP is technically mature to proceed to the next ASIP phase. ASIP, if shown to be feasible, would be conducted in three phases. Phase I, a 9-12 month feasibility study, will be conducted during FY01 and will provide a determination concerning feasibility of upgrading the Arrow Weapon System and a detailed plan if shown to be feasible.</p> <p>Since Arrow program initiation in 1988, Israel successfully improved the performance of its pre-prototype Arrow I interceptor to the point that it achieved a successful intercept and target destruction in June 1994. Arrow II design and component testing progressed to the successful demonstration of the new warhead, electro-optical seeker, radar fuse, first stage booster, sustainer booster, launcher canister, and launcher. The ADP IA was signed in March 1996, and Presidential certification was completed in May 1996. Under the ADP agreement, the first flight test of the integrated AWS, a non-intercept fly-out test, was successfully completed on September 14, 1998. This was a combined ACES/ADP flight test, and its success marked the conclusion of the ACES Program. This flight test was the first in which the other elements of the AWS, rather than test range assets, were used to control and communicate in-flight with the Arrow missile. This test demonstrated the technical maturity of the AWS and was followed by a successful integrated system intercept test against a ballistic missile target on November 1, 1999. Following the successful intercept of an incoming Black Sparrow target on September 14, 2000, the Israeli Air Force declared the Arrow Weapon System operational on October 16, 2000.</p> <p>The ITB Program is a medium-to-high fidelity theater missile defense simulation that provides the capability to evaluate potential Israeli missile defenses, aids the Israeli Ministry of Defense (IMoD) in the decision of which defense systems to field, provides insights into command and control in TMD and the role of Human-in-the-Loop (HIL), and trains Israeli Air Force personnel to function in a TMD environment. A structured set of joint U.S./Israeli experiments is being executed to evaluate the role of missile defenses in Middle East theater operations. This funding also provides for a portion of the operation and maintenance of the ITB and for planned enhancements. The implementation of the Distributed Interactive Simulation (DIS) and high level architecture (HLA) technologies enables joint exercise experiments to be conducted both in Israel and across the water between U.S. TMD and Israeli TMD systems, using a combination of such modeling and simulation tools as the Extended Air Defense Simulation (EADSIM), Extended Air Defense Test Bed (EADTB), and the ITB.</p>		
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<p>ITB experiments are used to validate the performance of the prospective near-term Israeli Theater Missile Defense System and provide valuable insight into the potential role of HIL for a TMD system. The ITB is being used as a tool to assist with the development of Combined Standard Operating Procedures (CSOP) between the U.S. European Command (USEUCOM) and Israel for potential combined TMD operations. Early warfighter activities in developing the CSOP at the ITB were invaluable during U.S. contingency operations in late FY98. Further ITB experiments involving the Israeli Air Force and USEUCOM were undertaken in FY00 and FY01 to finalize combined operating procedures and to begin the integration of the AWS in USEUCOM'S CSOP and Operations Plan (OPLAN).</p> <p>The ISA&amp;I tasks provide ongoing analysis and assessment of the baseline, evolutionary, and responsive threats to support the definition and evaluation of an initial Israeli Reference Missile Architecture (IRMA), a baseline missile configuration from which to assess and evaluate architectural effectiveness. Evolutionary growth paths to enhance the IRMA robustness against future threats are being identified. Critical TMD system architecture issues and technologies are being analyzed, and the conformance to established requirements of various TMD programs, including the Arrow Deployability Program (ADP), Boost Phase Intercept concepts, and the ITB are being conducted. Finally, previously developed simulations and models are being used selectively to address significant TMD issues. Collectively, the tasks conducted under this cooperatively sponsored ISA&amp;I project provide critical insights and technical data to both the U.S. and Israeli governments for improving near-term and evolutionary defenses against ballistic missile threats.</p> <p>The ISA&amp;I project activities have demonstrated that defense of the State of Israel from Theater Ballistic Missile (TBM) attacks is necessary, feasible, and cost-effective. The ISA&amp;I effort analyzed and addressed numerous TMD system issues including HIL, resource allocation, and threat analysis. The United States benefited from the architecture analysis work, including identification and progress toward resolution of critical TMD system issues such as kill assessment and the lethality study of a novel interceptor warhead. The ISA&amp;I is playing a critical role in identifying possible AWS upgrades to preserve system effectiveness as more robust regional ballistic missile threats continue to evolve.</p> <p>The cooperative R&amp;D program supports the advancement of emerging TMD technologies. The IMoD and the BMDO will jointly measure the phenomenology and kinematics of theater ballistic missile systems.</p> <p><b>FY 2000 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>76923 Arrow Deployability Program. Continued AWS development to migrate the system toward an initial operational capability and validate activities via integrated flight tests. Transferred the results of the AWS tests to U.S. TMD interceptor developers. Conducted two successful intercepts of ballistic missile targets with the integrated Arrow Weapon System. Continued lethality, kill assessment, and producibility studies leading to an Israeli operational capability. Continued interoperability activities to include upgrading the Citron Tree battle management software to accept Link-16 messages. The TMDSE Proof-of-Concept (TPOC) test in July 2000 laid the groundwork for the Closed Loop test in FY01 that validated that the AWS could interoperate with U.S. TMD systems via common Link-16/Tactical Digital Information Link "J" (TADIL-J) protocols. Funding includes \$45M Congressional plus-up to offset Israel's continued requirement for procurement of components for a third Arrow battery.</li> </ul>		
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•	1889	Israeli Test Bed (ITB). Continued ITB experiments on near-term improvements to the Arrow TMD system deployability. Provided improved threat model and Arrow II update enhancements. Conducted distributed interactive simulation over-the-water experiments. Supported USEUCOM/Israeli Air Force (IAF) CSOP and Commander-in-Chief (CINC) USEUCOM exercise requirements utilizing the ITB.									
•	1173	Israeli System Architecture and Integration (ISA&I). Analyzed results of ITB Interoperability experiments. Continued evaluations of the performance of the near- and far-term TMD system based on ADP system flight tests and evolving regional threats. Continued analysis of TMD system refinements necessary to defeat future threats such as the evolving Iranian Medium Range Ballistic Missiles (MRBM) threats.									
Total		79985									
<b>FY 2001 Planned Program:</b>											
•	81286	Arrow Deployability Program. Continue AWS development. Conduct an intercept of a ballistic missile target with the integrated Arrow Weapon System. Continue to transfer system development and flight test results to U.S. TMD interceptor developers. Continue activities for achieving and validating technical interoperability via the Closed Loop testing involving the AWS, U.S. PATRIOT and Aegis. Continue lethality and kill assessment efforts to achieve high confidence kill assessment. Funding includes \$45M, which allows Israel to reduce ADP funding and continue procurement of components for the third Arrow battery. Funding also includes \$6M Congressional add-on which funds interoperability work in FY01 and repays the Government of Israel for funding interoperability work in FY00.									
	8000	Arrow System Improvement Program (ASIP). Initiate Arrow System Improvement Program (ASIP) Feasibility Study to define performance requirements and technical improvements for enhancing the AWS capability against emerging longer-range and more robust TBM threats in the Middle East. This effort will be funded in FY01 by an \$8M Congressional add-on.									
•	2098	ITB. Continue ITB experiments related to the operational Arrow TMD system deployability. Provide improved threat model and Arrow II update enhancements. Support USEUCOM/IAF CSOP development and CINC USEUCOM exercise requirements.									
•	1592	ISA&I. Analyze results of ITB Interoperability experiments. Continue evaluations of the performance of the AWS. Continue analysis of TMD refinements for AWS to remain effective against future emerging threats									
•	1300	Cooperative R&D. Instrument test threat missile and conduct flight test.									
Total		94276									
<b>B. Other Program Funding Summary</b>		<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
N/A											
<p><b>C. Acquisition Strategy:</b> This is an ongoing cooperative U.S./GOI development program. By completing the Arrow Deployability Program, U.S. TMD programs will be afforded state-of-the-art technical data for program risk reduction and the Government of Israel will have developed a robust AWS to defend against known regional ballistic missile threats. Through the ADP, Link-16-based interoperability between the AWS and U.S. TMD systems will be achieved. The United States and the Government of Israel, under the umbrella of the various Memoranda of Agreements, share project costs. The U.S. share of total funding is based upon the maturity of the development. The</p>											
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<p>ADP will be completed in FY02. The Government of Israel will continue to fund the acquisition of Arrow Weapon System components beyond FY02. The Government of Israel is interested in continuing missile defense cooperation beyond the Arrow Deployability Program. The Arrow System Improvement Program feasibility study was funded via a Congressional \$8M plus-up in FY01 and the final results of that study will provide a basis for assessing the viability of a follow-on FY02-07 cooperative missile defense program.</p>																																																																																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><b>D. Schedule Profile</b></th> <th><u>FY 2000</u></th> <th><u>FY 2001</u></th> <th><u>FY 2002</u></th> <th><u>FY 2003</u></th> <th><u>FY 2004</u></th> <th><u>FY 2005</u></th> <th><u>FY 2006</u></th> <th><u>FY 2007</u></th> </tr> </thead> <tbody> <tr> <td>Initiate Interoperability Tests (APOC I)</td> <td>1Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Arrow Weapon System Flight Tests</td> <td>1Q &amp; 4Q</td> <td>3Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>U.S. Benefits Review</td> <td>1Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Conduct TMDSE Proof-Of-Concept Test I</td> <td>2Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Conduct TMDSE Proof-Of-Concept Test II</td> <td></td> <td>2Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Initiate Interoperability Tests w/ U.S. TMDSE</td> <td></td> <td>2Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ADP final Third Battery Cost Share Adjustment</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Complete ASIP Feasibility Study</td> <td></td> <td>4Q</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Complete ADP</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Conduct cooperative R&amp;D Flight Test</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>									<b>D. Schedule Profile</b>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	Initiate Interoperability Tests (APOC I)	1Q								Arrow Weapon System Flight Tests	1Q & 4Q	3Q							U.S. Benefits Review	1Q								Conduct TMDSE Proof-Of-Concept Test I	2Q								Conduct TMDSE Proof-Of-Concept Test II		2Q							Initiate Interoperability Tests w/ U.S. TMDSE		2Q							ADP final Third Battery Cost Share Adjustment									Complete ASIP Feasibility Study		4Q							Complete ADP									Conduct cooperative R&D Flight Test								
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BMDO RDT&E COST ANALYSIS (R-3)										DATE <b>June 2001</b>		
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ADP Development and Third Arrow Battery	International Agreement with Israel	Israel Ministry of Defense, Israel	115278	78286								
b. Arrow System Improvement Program	International Agreement with Israel	Israel Ministry of Defense, Israel		8000	2Q							
c. ISA&I	FFP with Cost Share	Wales, Ltd., Israel	2622	1592								
d. ITB	FFP	USA/SMDC Huntsville, AL	3651	1963								
e. Gov Personnel & Spt	Direct Funding	USA/SMDC Huntsville, AL	138	135								
f. Cooperative R&D	FFP	USA/SMDC Huntsville, AL		1300	2Q							
Subtotal Product Development:			121689	91276								
Remark:												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ADP Arrow Project Office	Direct Funding	PEO/AMD	6092	3000	N/A							
Subtotal Support Costs:			6092	3000								
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												
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Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:			127781	94276								
Remark:												
<div style="display: flex; justify-content: space-between;"> <span>Project 2259</span> <span>Page 15 of 15 Pages</span> <span>Exhibit R-2A (PE 0603875C)</span> </div>												

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